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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/726,856	12/02/2003	Sharat Singh	033.06-1US	5950

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MONOGRAM BIOSCIENCES
345 OYSTER POINT BLVD
SOUTH SAN FRANSISCO, CA 94080

EXAMINER	
TUNG, JOYCE	
ART UNIT	**PAPER NUMBER**
1637	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	02/28/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/726,856	SINGH ET AL.	
	Examiner	Art Unit	
	Joyce Tung	1637	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *12/21/06*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *11-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *11-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

The response filed 12/21/06 to the Office action has been entered. Claims 11-20 are pending.

1. Claims 11-20 remain rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-11 of U.S. Patent No. 6,686,152 since the response did not include the terminal disclaimer.

2. Claims 11-20 remain rejected under 35 U.S.C. 103(a) as being unpatentable over Grossman et al. (5470705, issued November 28, 1995) in view of Babon et al. (5,851,770, issued Dec. 22, 1998).

Grossman et al. disclose a method of detecting a plurality of different sequences in a target sequence involving the use of a plurality of sequence probes (See column 2, lines 54-56). The probe used in the method has the features of the electrophoretic probe cited in claims 14 and 19. The probe includes a binding polymer, a polymer chain that imparts to that probe, a distinctive ratio of charge/translational frictional drag and a reporter attached to the binding polymer (See column 20, lines 52-57). The binding polymer is an oligonucleotide including at least 10-20 bases allowing hybridization to the target polynucleotide (See column 6, lines 66-67 and column 7, lines 1-10). This teaching is inherent that the target polynucleotide is in the range of from 5-100 polynucleotide as recited in claim 15. Other binding polymers are analogs of polynucleotides, such as deoxynucleotides with thiophosphodiester linkage (See column 7, lines 11-19). The polymer chain has a ratio of charge/translational frictional drag, which is evidenced by a distinctive electrophoretic mobility in a non-sieving matrix (See column 7, lines 50-64). The polymer chain can be polyethylene oxide (PEO) or a polypeptide chain where the chains are

attached to different-sequence binding polymers (See column 3, lines 11-18). The teachings suggest that the charge/translational frictional drag is consisted of carbon, hydrogen, oxygen, phosphorus, nitrogen, sulfur and boron. The charge of the polymer is the total net electrostatic charge of the polymer at a given pH (See column 6, lines 15-16). It is inherent that the probes have a positive charge or a negative charge based upon the given pH. The label refers to a fluorophore or chromophore (See column 6, lines 39-44). The features of Grossman et al.'s probe suggest the features of the claimed e-tag probe.

Grossman et al. do not explicitly disclose the molecular weight of the mobility modifier, which is 1 to 300 atoms or 30-3000 dalton, or from 35-1500 daltons. However, the binding polymer and polymer chain contribute to the mobility modifier of probe (See column 3, lines 55-64,). The polymer chain may be polyethylene oxide (PEO) or a polypeptide chain (See column 3, lines 11-18, column 7, lines 39-49). Since these molecules are small molecules, the teachings are inherent that the molecular weight of the mobility modifier would be from 1 to 300 atoms or from 30-3000 daltons or from 35-1500 daltons.

Grossman et al. also do not explicitly disclose that e-tag reporter has a molecular weight of from 150-10,000 daltons. However, the e-tag is defined in claims 14-15 and 19 containing mobility modifier. As discussed in the previous paragraph regarding the molecular weight of mobility, the teachings of mobility modifier read on the limitation regarding the molecular weight of e-tag.

Grossman et al. do not explicitly disclose a capture agent that specifically binds the capture ligands of the electrophoretic probes and confers on the undigested electrophoretic probes a charge that causes the undigested electrophoretic to migrate upon electrophoretic

separation in a direction opposite of that of the e-tag reporters, thereby excluding said undigested electrophoretic probes from the electrophoretic separation of the released e-tag as recited in claim 11, and the capture ligand and the capture agent recited in claims 17-18 and 20.

Babon et al. disclose a method for detecting on or more mismatches between a first and second nucleic acid in which the heteroduplex formed between the first and second nucleic acid sequence is biotinylated and captured by binding to streptavidin-magnetic beads (See column 7, lines 53-66) and the captured heteroduplex are than cleaved, the cleaved fragment is analyzed by gel electrophoresis (See column 8, lines 1-4). The capture ligand and capture agent includes antigen/antibody or DNA binding protein and its DNA binding site (See column 18, lines 13-24).

Nevertheless, Babon et al. do not explicitly disclose the capture agent which confers on the undigested electrophoretic probes a charge that causes the undigested electrophoretic to migrate upon electrophoretic separation in a direction opposite of that of the e-tag reporters, thereby excluding said undigested electrophoretic probes from the electrophoretic separation of the released e-tag as recited in claim 11. However, the claims further recite the capture ligands and agents in claims 17-18 and 20, which are the same capture ligands and agents used in the method of Babon. This is inherent that the capture ligands and agents would have the same function as recited in claim 11.

One of ordinary skill in the art at the time of the instant invention would have been motivated to modify the method of Grossman et al. by using the capture ligand/agent attached to the oligonucleotide probe as taught by Babon et al. because by using this technique, the background signal is dramatically reduced, thereby increasing the sensitivity and specificity of the mismatch cleavage assay (See column 7, lines 27- 37). Thus, it would have been prima facie obvious to apply the capture ligands and agents as recited in claims 17-18 and 20.

The response argues that the statement as set forth on page 5 of the Office action mailed 6/21/06 that claims 17 and 18 recite the same capture ligands and capture agents as disclosed by

the teachings of Babon and the capture ligands and capture agents would have the same function as recited in claim 11 is Examiner's personal experience. However this is not examiner's personal experience. Since Babon et al. teach using the capture ligands and capture agents to separate PCR products via gel electrophretic methods (See column 7, lines 53-67), it is obvious for one of ordinary skill in the art to apply the capture ligands and capture agents as taught by Babon et al. to exclude the undigested electrophoretic probes from the released eTag reporters via electrophoretic separation. Thus, the teachings of Babon et al. are not the Examiner's personal experience, and the Examiner's affidavit is not necessary.

The response argues that Grossman et al or Babon et al do not disclose a single separation between the undigested electrophoretic probes and the eTag reporters. However the limitations of claims do not indicate that the separation is a single separation between the undigested electrophoretic probes and the released eTag reporters. Moreover, the instant claims require the use of a capture agent and the claim uses the phrase "comprising" to describe the method steps. This allows anything to be used for performing the method, for example, there might be a solid support applied. Therefore, the teachings of Babon et al. read on the limitations of the claims.

The response argues that Grossman et al. do not disclose electrophoretic probes having a cleavable linkage L. Grossman et al. disclose that each probe includes a binding polymer, which is modified by enzymatic cleavage when bound to a target sequence. The cleavage reaction may remove a portion of the binding polymer, to modify the probe's ratio of charge/translational frictional drag or may separate a reporter label carried at one end of the binding polymer from a polymer chain carried at the other end of the binding polymer, to modify the charge/translational frictional drag of the binding polymer carrying the reporter label (See column 3, lines 54-64).

Moreover, since there is no definition of the phrase "a cleavable linkage" recited in the claims, the teachings of Grossman et al. set forth above read on the limitations of the claims.

Based upon the analysis above, the rejection is maintained.

Summary

3. No claims are allowable.

4. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Joyce Tung whose telephone number is (571) 272-0790. The examiner can normally be reached on Monday - Friday, 8:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gary Benzion can be reached on 571 272-0782. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Joyce Tung J.T.
February 21, 2007

KENNETH R. HORLICK, PH.D
PRIMARY EXAMINER
2/22/07